Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
L-3 CYTERRA	)	WP Docket No. 09-2
	)	
Request for Waiver to Allow Certification and Use of Electromagnetic Motion Detection and Ranging Devices Operating at 3100-3500 MHz	)	

ORDER

Adopted: November 24, 2009 **Released: November 25, 2009**

By the Deputy Chief, Wireless Telecommunications Bureau, and Deputy Chief, Public Safety and Homeland Security Bureau:

I. INTRODUCTION

1. We have before us a request filed by L-3 CyTerra (CyTerra), a division of L-3 Communications Corporation, for waiver of Part 90 of the Commission's Rules[1] with respect to its Electromagnetic Motion Detection and Ranging (EMMDAR) sensor, a handheld radar device operating in the 3100-3500 MHz band that is capable of sensing motion through walls.[2] A waiver is required because the EMMDAR's frequency usage is inconsistent with the Commission's technical rules.[3] CyTerra seeks a waiver to permit equipment certification of the EMMDAR, and its use by state and local public safety agencies. The Wireless Telecommunications Bureau and Public Safety and Homeland Security Bureau sought comment on the waiver request, and no party opposed it.[4] We grant the waiver request to the extent indicated below.

II. BACKGROUND

2. The EMMDAR is a compact, lightweight handheld sensing device able to "see through walls."[5] The device can detect both fast movement, such as a person walking or running, and very small

[1] 47 C.F.R. Part 90.

[2] *See* L-3 CyTerra, Request for Waiver, filed February 22, 2008 (Waiver Request).

[3] CyTerra requests a waiver with respect to two versions of the device, EMMDAR and EMMDAR II. The EMMDAR and EMMDAR II have identical transmission characteristics, but differ in their circuitry and user interfaces: the EMMDAR locates one target at a time, and indicates its range but not its direction; the EMDDAR II locates multiple targets, and indicates their ranges and directions. *See* Waiver Request at 5 n.3. Unless otherwise specified, references herein to the EMMDAR encompass both versions.

[4] *See* Wireless Telecommunications Bureau Seeks Comment on Request for Waiver by L-3 CyTerra to Allow Certification and Use of Electromagnetic Motion Detection and Ranging (EMMDAR) Devices Operating at 3100-3500 MHz, *Public Notice*, 24 FCC Rcd 77 (WTB/PSHSB 2009). No comments were filed. CyTerra filed reply comments. After the filing deadline, letters of support were received from the San Diego Sheriff's Department and the Jacksonville Beach Police Department, SWAT Team 1.

[5] Waiver Request at 1, 5.

movement, such as the breathing of a restrained or unconscious victim or the slight sway of a person trying to stand still.[6] Possible applications include locating hostile persons or hostages prior to a forced entry, locating unconscious or captive persons, and scanning walls and large vehicles to locate missing or escaped prisoners.[7] The EMMDAR can accurately locate moving targets in one second, and immobile (breathing) targets in less than three seconds.[8] While users may activate the device for longer than that in order to increase their confidence in the result, the device cannot be locked on, and automatically shuts off after one minute.[9] CyTerra asserts that EMMDAR will be operated infrequently, for short periods, and rarely (if ever) at the same place twice.[10]

3. The 3100-3500 MHz band is allocated to the Federal Government Radiolocation service on a primary basis, and to non-Federal radiolocation on a secondary basis.[11] In addition, the 3100-3300 MHz band is allocated to Federal and non-Federal Earth exploration-satellite and space research on a secondary basis; and the 3300-3500 MHz band is allocated to the amateur service on a secondary basis.[12]

4. While the 3100-3500 MHz band is allocated for radiolocation, CyTerra requests a waiver because the EMMDAR does not operate like a normal radar device. Specifically, rather than operating on a single frequency like most radars, the EMMDAR steps through two hundred frequencies, spaced two megahertz apart from 3101 MHz to 3499 MHz, one at a time.[13] It transmits on one frequency for 75 microseconds with a peak instantaneous power of 31.6 milliwatts, followed by a 17.5-microsecond "off time" between frequency steps.[14] The complete cycle repeats every 18.5 milliseconds, resulting in a duty cycle for each frequency of 0.41%.[15]

5. CyTerra states that increasing the number and spacing of frequency steps greatly improves the reliability and precision of target location.[16] It states that the need for multiple, well-spaced frequencies precludes unlicensed operation in the Part 15 902-928 MHz or 2.4 GHz bands because there are not enough frequencies in those bands, and that the 5.8 GHz unlicensed band is unworkable due to insufficient propagation and building penetration.[17]

6. CyTerra proposes several conditions on the waiver to minimize potential interference.

[6] *Id.* at 5.

[7] *Id.* at 2, 5-6. CyTerra asserts that the EMMDAR's capabilities will greatly increase the probabilities for survival of hostages, victims, and rescuers. *Id.* at 5-6.

[8] *Id.* at 2, 5, 10.

[9] *Id.* at 2, 10, 15.

[10] *Id.* at 3, 10.

[11] *See* 47 C.F.R. § 2.106; *see also* 47 C.F.R. § 90.103(b).

[12] *See* 47 C.F.R. § 2.106; *see also* 47 C.F.R. § 97.303(*l*)(2).

[13] *See* Waiver Request at 2, 7.

[14] *Id.*

[15] *Id.*

[16] *Id.* at 2, 8.

[17] *Id.* at 8-9.

Specifically, it proposes limiting eligibility to state and local police and firefighters; limiting use to actual emergencies involving threats to safety of life, and necessary training; prohibiting use outdoors above ground level or on fixed outdoor infrastructure; and limiting the number of units to be sold to 5,000 during the first year following equipment approval, and 10,000 during the second year.[18] It also proposes coordinating applications for use within specified distances of particular sites like radio astronomy telescopes, if necessary.[19] CyTerra asserts that these conditions, coupled with the EMMDAR's technical and operational characteristics, make it unlikely that the device will cause interference to other users.[20]

III. DISCUSSION

7. Section 1.925 of the Commission's Rules provides that we may grant a waiver if it is shown that (a) the underlying purpose of the rule(s) would not be served or would be frustrated by application to the instant case, and grant of the requested waiver would be in the public interest; or (b) in light of unique or unusual circumstances, application of the rule(s) would be inequitable, unduly burdensome, or contrary to the public interest, or the applicant has no reasonable alternative.[21] For the reasons set forth below, we conclude that grant of the requested waiver is warranted.

8. CyTerra states that the EMMDAR's low power, low duty cycle, and sparse deployment eliminate any realistic likelihood of harmful interference to other users. The EMMDAR's peak instantaneous power is substantially below the power limits for non-Federal radiolocation in the 3300-3500 MHz band.[22] As CyTerra notes, secondary amateur operations in the 3300-3500 MHz band also operate with much higher power than the EMMDAR[23] without causing harmful interference to other users.[24] Similarly, given the difference between amateur power levels and the EMMDAR's low power, interference to amateur operations appears to be equally unlikely.[25] We agree that these factors considerably reduce the potential for interference to other users.

9. As proposed by CyTerra, we will limit eligibility to state and local police and firefighters; and limit use to actual emergencies involving threats to safety of life, and necessary training. We also adopt CyTerra's proposal to limit the number of units to be sold to 5,000 during the first year following equipment approval, and 10,000 during the second year (with no limit in subsequent years). Because the device will be used in emergency situations, we do not believe it is practical to limit outdoor use to ground level; however, we prohibit the device from being mounted on a fixed outdoor infrastructure, as this would increase the interference potential of the device.

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[18] *Id.* at 3-4, 9, 15-16.

[19] *Id.* at 4, 13, 16. We note that note US342 to the Table of Allocations states that "all practicable steps shall be taken to protect the radio astronomy service from harmful interference" in specified bands, including 3260-3267 MHz, 3332-3339 MHz, and 3345.8-3352.5 MHz. *See* 47 C.F.R. § 2.106 n.US342.

[20] *See* Waiver Request at 3, 13, 15.

[21] 47 C.F.R. § 1.925(b)(3); *see also* WAIT Radio v FCC, 418 F.2d 1153, 1159 (D.C. Cir. 1969).

[22] *See* 47 C.F.R. § 90.103(c)(13) (permitting five watts peak power into the antenna). The power limit for non-Federal radiolocation in the 3100-3300 MHz band is determined on a case-by-case basis. *See* 47 C.F.R. § 90.205(r).

[23] *See* 47 C.F.R. § 97.313(b) (permitting 1500 watts peak effective power).

[24] *See* Waiver Request at 3, 13.

[25] *Id.* at 13-14.

10. Consequently, we conclude that grant of the requested waiver for a device with the technical parameters described by CyTerra (*i.e.*, the EMMDAR transmits on one frequency for 75 microseconds with a peak instantaneous power of 31.6 milliwatts,[26] followed by a 17.5-microsecond "off time" as it steps one at a time through two hundred frequencies, spaced two megahertz apart from 3101 MHz to 3499 MHz; the device cannot be locked on, and automatically shuts off after one minute) is consistent with the underlying purpose of the Commission's Rules. We also conclude, given the public safety benefits of the EMMDAR, that a waiver grant is in the public interest.

11. CyTerra must obtain equipment authorization for the EMMDAR and EMMDAR II devices. A copy of this *Order* shall be submitted with the equipment authorization applications.

12. Operation of EMMDAR devices by eligible entities will require a separate Commission authorization from the Wireless Telecommunications Bureau, using radio service code RS (radiolocation service).[27] Applicants may apply for authorization on the 3100-3500 MHz band, rather than listing each of the two hundred frequencies on which the EMMDAR operates. While Part 90 frequency coordination[28] is not required, we will coordinate the applications with the National Telecommunications and Information Administration.[29] Applicants must specify the number of units and the proposed area of operation. Applications must reference this *Order* by the DA number set forth above. No operation is permitted prior to license grant, and no applications will be granted until CyTerra obtains equipment authorization.

IV. CONCLUSION

13. We conclude that CyTerra has demonstrated that a waiver of Part 90 of the Commission's Rules to permit certification and licensing for the EMMDAR and EMMDAR II devices is warranted. The unique benefits to the public safety community justify a waiver to permit operation in the 3100-3500 MHz band, which is allocated for non-Federal radiolocation. In addition, the low power output of the device, the automatic cut-off function, and the limited use of the device minimize potential interference to other services in the band.

V. ORDERING CLAUSES

14. Accordingly, IT IS ORDERED, pursuant to Sections 4(i) and 303(i) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 303(i), and Section 1.925 of the Commission's Rules, 47 C.F.R. § 1.925, that the Request for Waiver of Part 90 of the Commission's Rules, filed by L-3 CyTerra on February 22, 2008, IS GRANTED SUBJECT TO THE CONDITIONS set

[26] The device transmits an unmodulated (CW) carrier (emission designator N0N). The emission must be 70 dB below the peak instantaneous power on any frequency removed from the operating frequency by more than 0.1 kHz, and 90 dB below the peak instantaneous power on any frequency removed from the operating frequency by more than 1 kHz. The device must meet a frequency stability of 350 parts per million. *See* CyTerra *ex parte* dated July 22, 2009.

[27] Ordinarily, licensees in the Public Safety Radio Services (such as state or local government entities) that already have a Commission license for a radio communications system may operate radar units without obtaining a separate license. *See* 47 C.F.R. § 90.20(f)(4); *see also* FCC Regulates Radar Transmitters, but Not Radar Detectors, *Public Notice*, 11 FCC Rcd 17268, 17268 (WTB 1996).

[28] *See* 47 C.F.R. § 90.175.

[29] License applications in particular areas may be denied in order to protect Federal Government radiolocation facilities.

forth in paragraphs 9 and 10, *supra*.

15. This action is taken under delegated authority pursuant to Sections 0.131 and 0.331 of the Commission's Rules, 47 C.F.R. §§ 0.131, 0.331.

FEDERAL COMMUNICATIONS COMMISSION

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